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Veröffentlichungsversion / Published Version
Arbeitspapier / working paper

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ZÖSS
ZENTRUM FÜR ÖKONOMISCHE
UND SOZIOLOGISCHE STUDIEN

Discussion Papers

ISSN 1868-4947/63
Discussion Papers
Hamburg 2017

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Discussion Paper
ISSN 1868-4947/63
Zentrum für Ökonomische und Soziologische Studien
Universität Hamburg
Juli 2017

Impressum:

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Herausgeber/Redaktion:

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Wage Dispersion and Pension Funds: Financialisation of Non-Financial Corporations in the USA, 1966-2013

by Ilhan Dögüs

Abstract

It has already been pointed out in the literature on financialisation that private pension funds have played a key role in the inflation of financial markets. This paper argues that an increase in wage dispersion between white-collar and blue-collar workers affects pension funds in a direct and structural manner. Using Saez-Zucman and fred.stlouisfed annual datasets, the proposed argument is statistically analysed by applying Vector Autoregressive modelling for the period 1966-2013 in the USA. The results show that the responses of share of pension funds within US-household wealth to one-unit shock in wage dispersion are positive and significant over the first three years. Furthermore, wage dispersion explains 11% of variations in pension funds' share in household wealth in the short-run and 19% of variations in the long-run. The study concludes that wage dispersion has a direct and structural impact on pension funds and contributes to the literature by clarifying the rise and expansion of pension funds.

Keywords: *financialisation, pension funds, wage dispersion, savings out of salaries, white-collar workers, capital market inflation*

JEL Classifications: *J31, D14, E44*

With a "stock-minded" public, as in the United States today, a rising stock-market may be an almost essential condition of a satisfactory propensity to consume; and this circumstance, generally overlooked until lately, obviously serves to aggravate still further the depressing effect of a decline in the marginal efficiency of capital.

(Keynes, 1960: 319)

1. Introduction

In Dögüs (2017a), I criticized the *Financial Constraint Approach* (FCA) to financialisation, which argues that investment and capital accumulation have fallen due to financial constraints that have been exacerbated by distributed profits, i.e. rising dividend and interest payments and buybacks (Hein, 2010); and I provided an alternative explanation that relies on the argument that Nonfinancial Corporations (NFCs) have prioritized reinvestment in financial assets over capital assets, since quasi-rent expectations from capital assets have declined due to depressed demand.

In order to underpin this argument, this paper deals with the inflation of financial markets. The aim is to understand how financial assets have become more profitable and thereby the "*entrepreneur corporation*" has become the "*rentier corporation*" (Toporowski, 1993: 42). The hypothesis to be tested is as follows.

Pension funds[1] have been affected by the increased wage dispersion between white-collar workers (ancillary overhead labour) and blue-collar workers (production labour)[2] in a direct and structural manner[3].

The 0.97 correlation between wage dispersion and pension funds' share in household wealth (see Figure 1) suggests that it needs to be tested whether or not there is a direct causality relationship between them.

[1] Keep in mind that I do not mean only private pension funds, discussion of which is very common in the literature. Private health insurance funds are also theoretically and empirically considered in this paper, since such funds are also being channeled to financial markets.

[2] In Dögüs (2017b), I explained that the wage dispersion between white-collar and blue-collar workers in last five decades has also been driven by increased market concentration. My distinction between white-collar and blue-collar workers has nothing to do with the skill-level of workers, unlike that proposed by the Skill-Biased Technological Change approach. Rather, it is based on the tasks workers perform. The essential point is whether these tasks are ancillary, innovative tasks whose purpose is to increase the market share / market power of the firm (such as sales operations, advertising, marketing, design, R&D, business management, etc.) or tasks whose purpose is simply to produce goods and services. The white-collar/blue-collar distinction might appear confusing, since some jobs might correspond to white-collar jobs despite their having nothing to do with increasing market power. Nonetheless, it represents the option that can be most readily tackled by way of analysis of the available data. Calling innovative ancillary labour white-collar work and manual labour blue-collar work would not lead to crucial empirical and theoretical shortcomings, despite the existence of challenging examples such as cleaners, accountants, etc. See Blanchflower and Oswald (1990) for similar definitions and a similar distinction.

[3] Other factors, such as institutional settings or an increase in the general income level, are outside the scope of this paper. I focus solely on the impact of wage dispersion as a sort of income inequality. See footnotes 14 and 16.

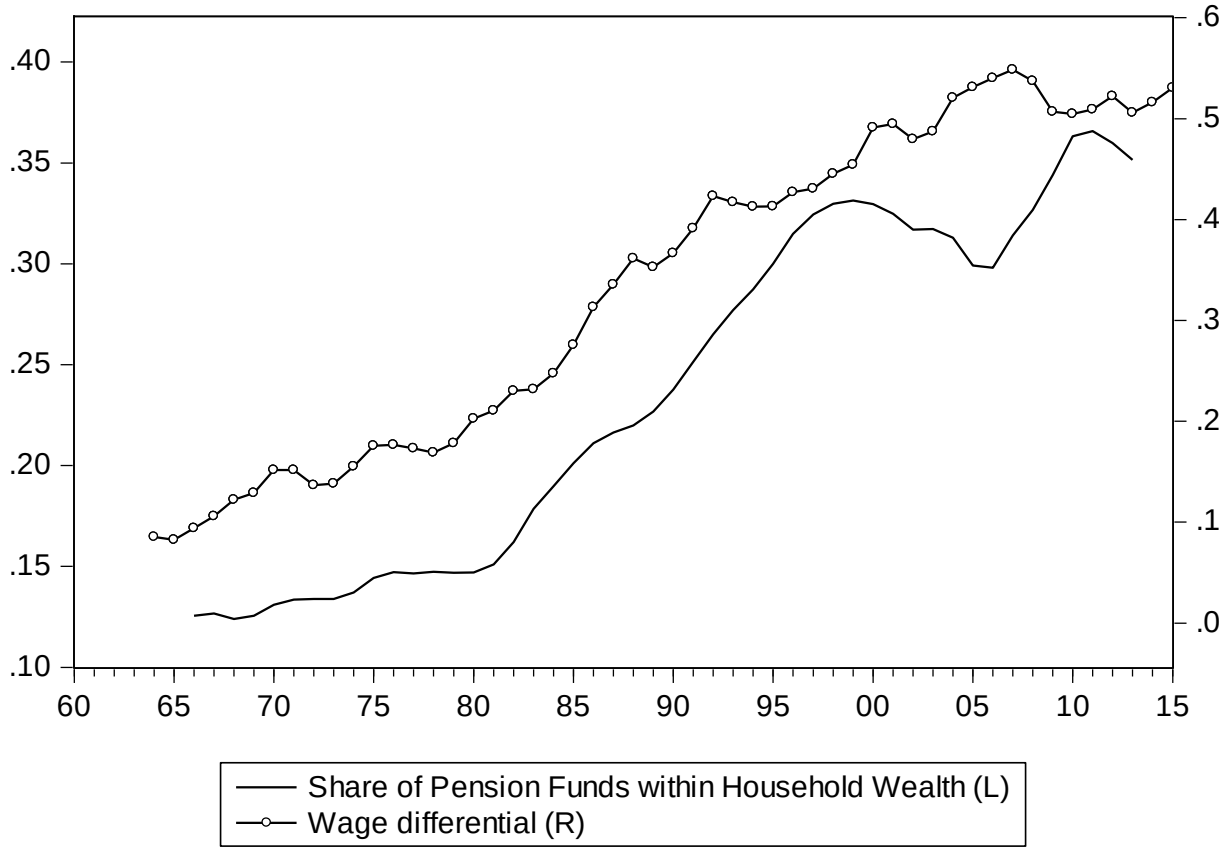

Figure 1: Wage differential (= ratio of salaries of ancillary workers to the wages of production workers), 1964-2015, USA (source: Own calculations based on https://fred.stlouisfed.org/) and Share of pension funds and insurance within household wealth, 1966-2013 (source: saezzucman.eu, Table A3)

The argument relies on the assumptions that higher income earners have a higher propensity to save (Kaldor, 1955-1956: 95) and that savings from salaries of white-collar workers are being channelled to financial markets through pension funds. It draws on the Capital Market Inflation Theory (hereafter CMIT) developed by Toporowski (2000), which highlights the relationship between financialisation[4] and pension funds.

Within the financialisation literature, CMIT is distinguished by the fact that it provides a comprehensive explanation of how pension funds have inflated the financial markets, of how financial markets operate, and also of why expectations of boosting investment by channelling long-term savings into financial markets via pension funds (Bonizzi and Churchill, 2016 and Toporowski, 2000: 51) might not be fulfilled.

However, it does not adequately explain the background to the rise and expansion of pension funds. Drawing on Steindl (1952: 113-121 and 1990), Toporowski (2008b: 10 and 2000: 49) very briefly mentions the role of middle class savings. He does not, however, elaborate upon the topic in detail. This paper strives to provide an explanation of the rise of pension funds via the savings from the salaries of white-collar workers

[4] "*Financialisation is broadly defined as the inflation of capital markets*" (Toporowski, 2008b: 1). I prefer to define it as "the recourse of previously nonfinancial corporations to the use of financial methods and instruments" (Dögüs, 2017a).

(i.e. "*professionals and big salary earners*", ibid., 115) that have been made possible by the increase in the wage gap[5].

In the literature, it has been mostly suggested that the emergence of private pension funds is a product of neoliberal institutional arrangements that delegate social welfare to financial markets[6]. To my knowledge, there are no studies that explain the rise of pension funds in economic terms and by its relationship to wage dispersion. Simlarly, the impact of wage dispersion on financialisation has yet to be discussed, except in Fontana et al. (2016), Herr and Ruoff (2014) and Dünhaupt (2014). However, the latter argue that financialisation leads to wage dispersion between financial sector workers and non-financial sector workers, as well as between executive and non-executive compensation. Darcillon (2012) shows that, besides labour market deregulation, financial liberalization also amplifies wage inequality. My argument does not deal with the wage differential between financial and non-financial workers and proposes the opposite direction of causality: Wage dispersion between white-collar workers and blue-collar workers (which has been driven by increased market concentration) has led to financialisation of NCFs via private pension funds. It is this reversal of the direction of causality that represents the paper's original contribution to the literature.

Palley (2015) takes composition into account by distinguishing the different wage levels of top managers, middle managers and manual workers. But he does not connect the matter to financialisation and the channeling of savings towards financial markets.

The paper is structured as follows. After a brief review of the CMIT with respect to the relationship between pension funds and the financialisation of NFCs, section three provides a modest explanation of the relationship between pension funds, on the one hand, and wage dispersion between white-collar and blue-collar workers, on the other. Chapter four tests the hypothesis by way of a Vector Autoregressive (VAR) model using US annual data for the period between 1966 and 2013. The final chapter concludes.

2. Pension Funds and Financialisation: Capital Market Inflation Theory

The relationship between financialisation and pension funds has already been widely discussed and examined in the literature by way of empirical studies[7]. It has been argued that the inauguration of private pension schemes in the 1970s led capital markets to inflate (Toporowski, 2000: 50; Bonizzi, 2015: 124; Guðmundsson, 2016: 297) and financialisation to emerge (Lazonick and O'Sullivan, 2000), since during this decade, "*the majority of stocks and shares*" started to be "*owned by pension funds and insurance companies*" (Toporowski, 2014: 104). McCarthy et al. (2016: 755-756) reports that after the 1970s, the asset allocation of pension funds in the USA underwent a tremendous shift towards corporate equities. Figure 2 shows that since 1980, the share of pension funds in household financial wealth has increased. In addition, Figure A6 of

[5] It could be argued that income and savings of capitalists should have been considered too. However, the number, income and savings of capitalists have not experienced a sharp shift, as is the case for white-collar workers, and hence do not demarcate a structural break. Wage dispersion between white-collar and blue-collar workers underwent a structural break in 1980. See Table 7 for test result. In addition, capitalist savings have been left out for the sake of simplicity.

[6] See Bonizzi, (2017: 22), Toporowski (2008b:13), Dixon (2008), and Ganßmann (2013).

[7] See McCarthy et al. (2016), Guðmundsson (2016), Dixon (2008), Dixon and Sorsa (2009), Bonizzi (2015), Engelen (2003), Ganßmann (2013), and Toporowski (2000).

saezzucman.eu shows that the share of profits and interest paid to pensions within capital income in the United States has continuously increased since 1970. In 2014, 49.3% of pension funds invested in stocks and the value of pension funds represented 96% of GDP[8]. This confirms that pension funds have functioned to inflate financial markets: The ratio of stock market capitalization to GDP for the United States has increased from 41,3% in 1980 to 146,2% in 2014[9].

It is worth recalling that "collective public pension schemes", like in Germany, might serve to sustain the consumption of elderly retirees, since their retirement benefits are paid by the contributions of people who are currently working. But private pension schemes, by contrast, serve to inflate financial markets.

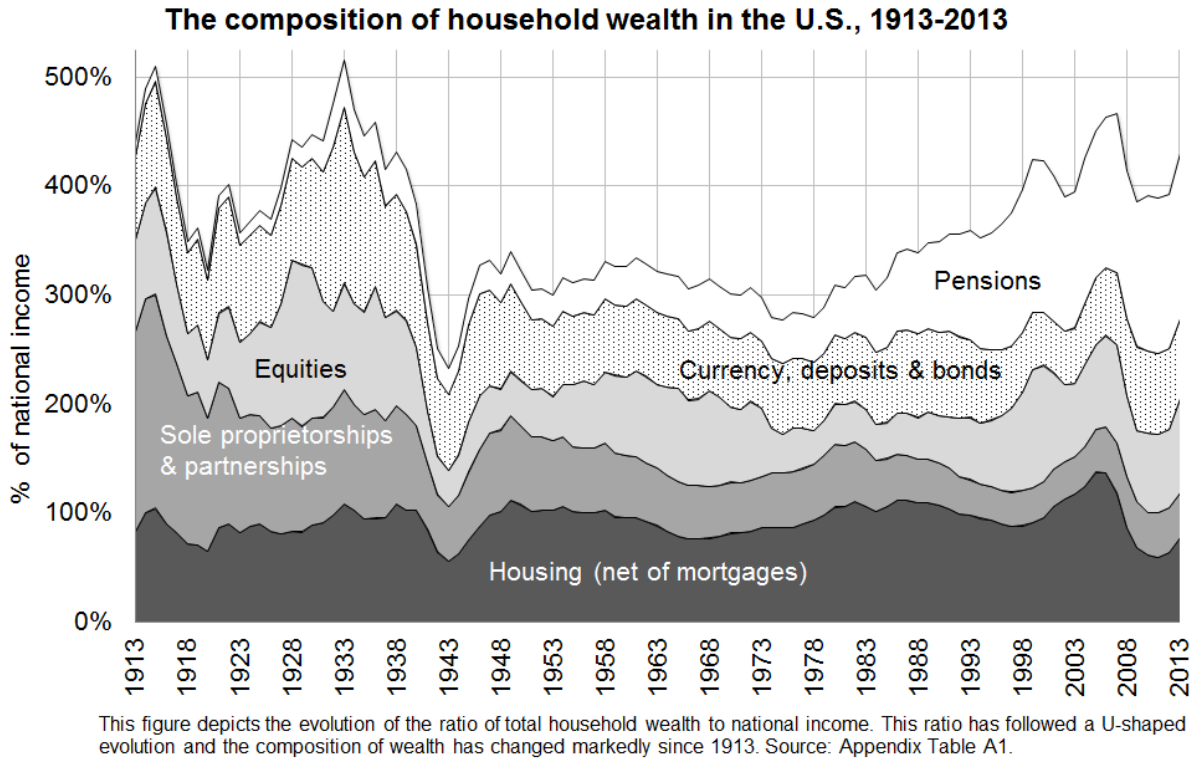

Figure 2: The composition of household wealth in the US as a share of GDP, 1913-2013. Source: saezzucman.eu – Main Data Figure 2

Toporowski points out that the excess inflow into financial markets, "*which is made up of the contributions to pension funds, plus the investment income which is not paid out as pensions*" (Toporowski, 2000: 69), inflates the prices of financial assets (ibid., 75). Thereby it stimulates the demand for financial assets by increasing the expected capital gains from them (Toporowski, 2008b: 8), as "*changes in profits and trends in stock prices attract savings from other nonfinancial securities markets, such as bank deposits, gold and property, which also act as repositories for savings*" (Toporowski, 2000: 32). This renders NFCs overcapitalized, by encouraging them to refinance "*in excess of their current needs*" (Toporowski, 1993: 29).

[8] https://www.oecd.org/finance/Pension-funds-pre-data-2015.pdf
[9] https://fred.stlouisfed.org/series/DDDM01USA156NWDB

Toporowski defines excess capital – which "*has been used to replace bank borrowing with cheaper long-term capital*"[10] or "*to buy short-term financial assets*" (Toporowski, 2008b: 9) – as the "*excess of liabilities held in financial assets over productive capital, i.e., the plant, equipment, materials, and stocks of unsold products and semi-fabricates* (ibid., Chapter 3 and Toporowski, 2008a: 4). For the sake of greater clarity, I would prefer to define it as the quantitative difference between capital (in terms of accounting, owners' equity) and nonfinancial assets corresponding to the quantitative difference between financial assets and financial liabilities. In other words, it is the capital not employed for real investment, but rather for financial operations: "*for managing the liquidity*" (ibid., 7) "*in search for speculative returns*" (ibid., 6) in "*inflated highly liquid financial markets*" (ibid., 4).

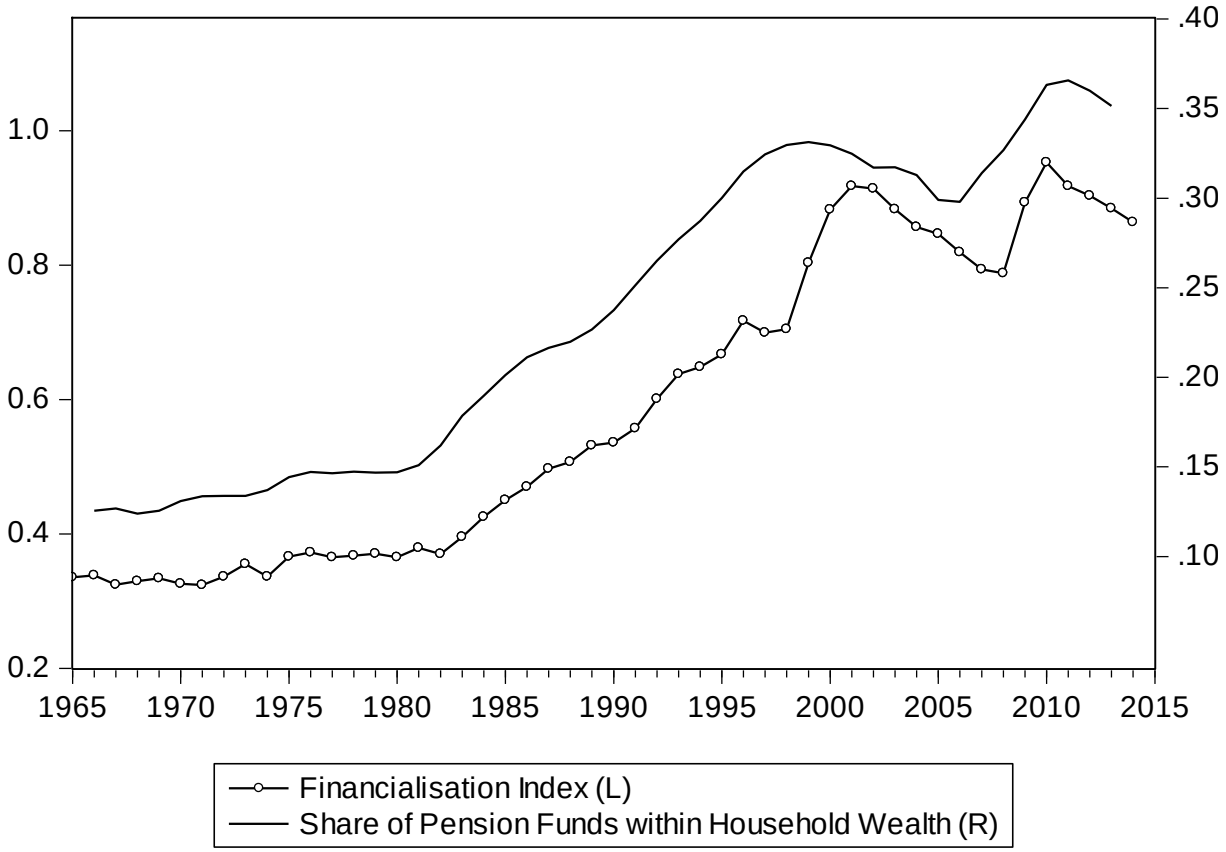

Figure 3: Share of pension funds within household wealth, USA, 1966-2013, Source: saezzucman.eu Table A2; and Financialisation Index (= Ratio of financial assets to non-financial assets held by US-NFCs.), 1965-2014, Source: own calculation based on research.stlouisfed.org/.

Concerning the financialisation of NFCs (i.e. their preferring to hold liquid financial assets over non-financial assets) due to capital market inflation, Toporowski states that "*capital market inflation has adverse consequences for listed companies and the economy as a whole because the resulting excessive gearing discourages investment*" in real capital assets (Toporowski, 2000: 46)[11]. Concerning the decrease in investment due

[10] Since the increasing prices of securities reduces interest and dividends and hence makes the issuance of stocks cheaper and more attractive (Toporowski, 2000: 50). However, the reduction in this market yield is offset by the additional return on capital gains that such inflation introduces into the capital market (ibid., 28).

[11] Whether the ability of firms to hedge their illiquid real investments with liquid assets might make real investment easier is debatable and calls for further research, since the main drivers of investment are

to savings out of the salaries of white-collar workers that flow into financial markets[12], the following statement by Minsky, similar observations by Steindl (1952: 113-121), is useful:

> *a high savings ratio out of wages diminishes and a low ratio increases business profits: the behaviour of saving out of wages amplifies the effect on profits of increases and decreases in investment.* (Minsky, 1986: 171)

By way of this process – namely, overcapitalization – the "*entrepreneur corporation*" has become the "*rentier corporation*" (Toporowski, 1993: 36-43) with "*a higher liquidity preference*" (ibid, 42). Due to higher liquidity preference, the ratio of liquid financial assets to non-financial assets held by US-NFCs has increased in the last three decades (see Figure 3). This development has mainly been driven by depressed demand for consumption goods (Dögüs, 2017a). In line with accounting principles, the higher ratio of financial assets to non-financial assets corresponds to an increase in excess capital (ibid, 23-24).

Finally, it is worth mentioning that large NFCs have "*access to capital markets*" and "*can afford to issue securities to replenish their liquid reserves*" (Toporowski, 2000: 56). Not surprisingly, they have excess capital and engage more in financial operations[13], i.e. "*balance sheet restructuring*" (Toporowski, 2008b: 9). By way of an empirical investigation of NFCs in the USA between 1971 and 2011, Davis (2013) found that mostly large NFCs have engaged in financial transactions.

3. Wage Dispersion and Pensions Funds

In this section, I do not explain the factors behind changes in savings (of white-collar workers): such as inflation, real interest rate, changes in income level (Keynes, 1960), income distribution, institutional arrangements, expectations, future or past income, etc. These have already been discussed in the relevant literature. I merely focus on the impact that a relative increase in the income and share in employment composition of white-collar workers has on the pension savings that are channelled to financial markets via private pension funds. The reasons why I do not prefer to focus on the impact of an increase in general income on pension savings are as follows: (i) It is not the increase in general income level, but wage dispersion that has been one of the distinguishing features of the last decades[14]; (ii) Pension savings do not simply correspond to ordinary

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the expected profits sustained by aggregate demand. To put it differently, if firms perceive that real investment would generate higher profits due to strong demand, then they might borrow or sell their financial assets, in order to finance investment in excess of internal funds (Minsky, 1986: 213). If non-financial assets increase due to real investment, then either financial liabilities increase (due to borrowing) or financial assets decrease (since they have been sold). If owner equity has not increased by the same amount, excess capital decreases as a result. After all, by definition excess capital is capital that is not employed for the acquisition of non-financial assets, but rather for the management and acquisition of financial assets.

[12] For the sake of simplicity, the savings invested in housing and real estate have been left out of the analysis. See footnote 15.

[13] See Dögüs (2017a) for a critique of the FCA, since it does not consider the role of firm size in the financialisation of NFCs.

[14] If (wage) inequality had not increased after 1980, the savings of high-income earners might not have been stimulated so much, due to higher price levels that were caused both by an increase in labour costs and by a consumption cascade that would be driven by the increase in income, especially, of low income-earning blue-collar workers who have a lower propensity to save. This represents the opposite of debt-deflation. In this sense, Herr and Ruoff (2014) assert that "*the living standard of the middle*

"*non-spending savings*" or, so to say, "*residual*", but rather they are induced by capital gains expectations[15]; (iii) As the rise in inequality indicates, the real income of lower-income earners, among them blue-collar workers, has declined or at least stagnated and hence they are not able to save, whereas high-income earners, among them white-collar workers, have earned more[16].

I first show that the wages (income) and savings of white-collar workers are higher and have increased[17] and then that the coverage rates for pension funds and health insurance, both of which inflate capital markets, is higher for white-collar workers.

Figure 4 shows that college-graduates (who are mostly employed as white-collar workers[18]) have a higher propensity to save than high-school graduates (blue-collar workers), since they earn more (see Figure 1).

class, including skilled workers will be slightly negatively affected by the increase of wages in the low-wage sector, whereas the living standard of the workers earning low wages will increase" (Herr and Ruoff, 2014: 35-36). For example, Cynamon and Fazzari (2013: 8) show that the demand of the top 5% of income-earners had a negative trend during the period 1989-2009.

[15] Capital gains are mostly used for "*extraordinary liabilities for health care, holidays, school fees, the purchase of housing, or the repayment of inconvenient debt*" (Toporowski, 2010). My calculations based on the Consumer Expenditure Survey (CES: http://www.bls.gov/cex/csxstnd.htm#2011) for the period from 1984 to 2011 support this argumentation: The share of expenditures for personal insurance and pensions, owned dwelling, mortgage, and education in white-collar workers' expenditures is higher by around 3% than the share for the same items in blue-collar workers' expenditures. The relationship between the consumption pattern of white-collar workers and market concentration calls for further research.

[16] Elucidation of the relationship between savings and income distribution requires further research based on "*Duesenberry's and Veblen's ideas on relative consumption and conspicuous consumption*" (Palley, 2008:3). Green (1991), Wildauer (2016), Nikiforos (2016), Perugini et. al. (2016), and Cynamon and Fazzari (2013) are some of the studies dealing with the relationship between income distribution and savings.

[17] Despite stability or an increase in the savings of white-collar workers, total savings have decreased (see https://fred.stlouisfed.org/series/PSAVERT), since low-income earners whose savings have fallen (increased debt due to a fall in their real income) constitute the majority of society.

[18] In 2011, underemployment of college graduates (i.e. their employment in jobs that do not require college degrees) was around 28%. (See stateofworkingamerica.org, Figure 4AK.)

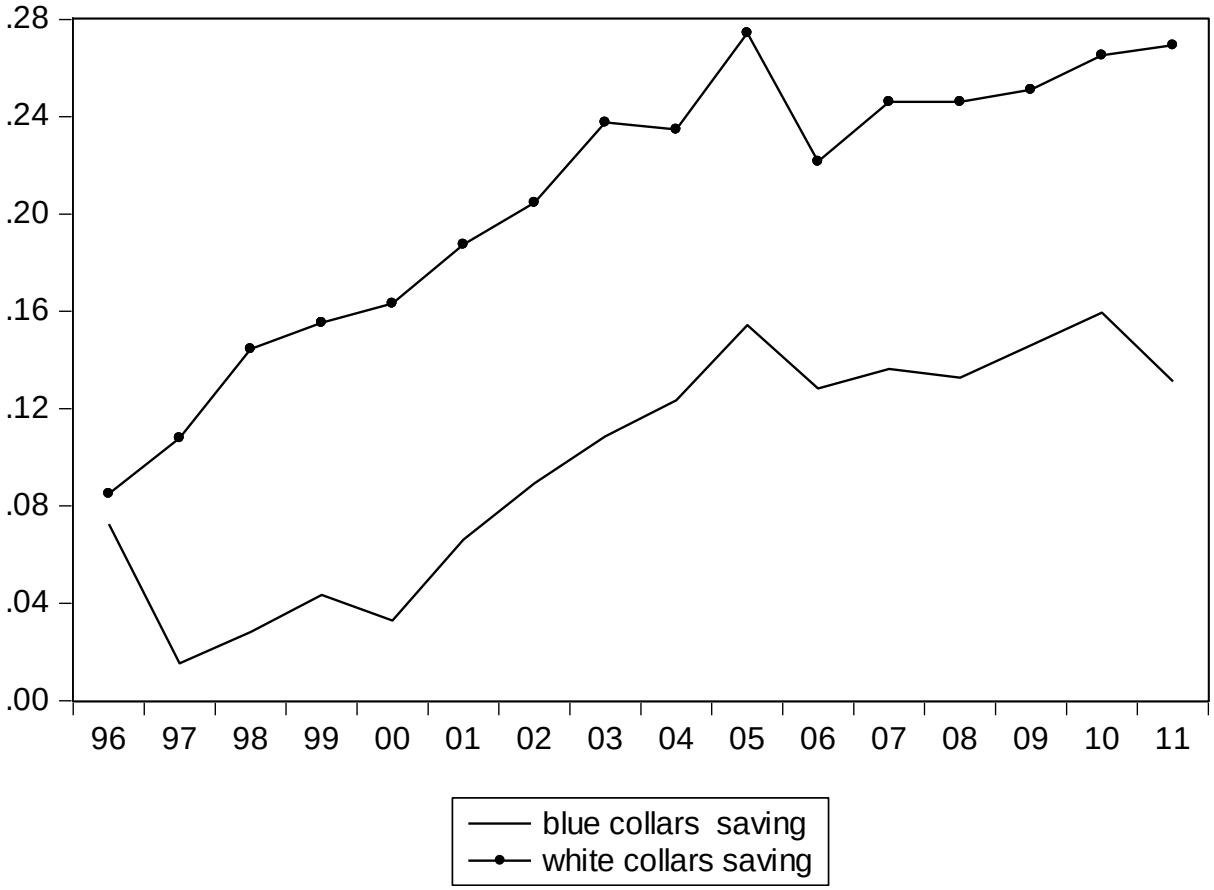

Figure 4: Average saving ratios (=1-real consumption expenditure/real income after taxes) of white-collar and blue-collar workers; USA, 1995-2011. Source: Own calculation based on the Consumer Expenditure Survey (CES) (http://www.bls.gov/cex/csxstnd.htm#2011)

If we consider Figure 4 in light of the fact that the share of college graduates in employment composition has increased from 14,7% in 1973 to 36,3% in 2016[19], then we can infer that the total savings out of the salaries of white-collar workers must have tremendously increased, due to both the rise in the employment share of white-collar workers and increased wage dispersion. Figure 5 makes this especially clear.

[19] See http://www.epi.org/data/#?preset=wage-education

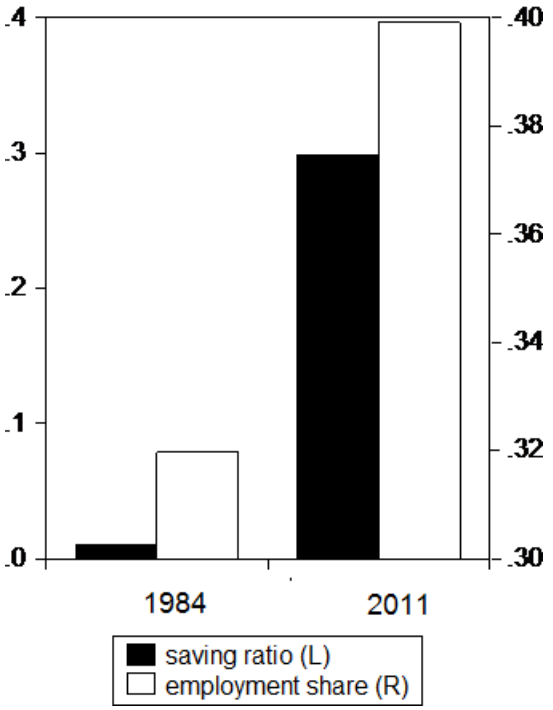

Figure 5: Average saving ratio (1- real consumption expenditure/real income after taxes) and employment share of white-collar workers (managers and professionals); USA, 1984-2011. Source: Own calculation based on the CES (http://www.bls.gov/cex/csxstnd.htm#2011)

The increase in the employment share and savings ratio of white-collar workers from 1984 to 2011 accounts for 35% of the total fall in real consumption expenditure by all wage and salary earners. To put it differently, if the employment share and savings ratio of white-collar workers were the same in 2011 as in 1984, then the total real consumption expenditure of workers would be 35% higher. As Minsky points out, this amount of total savings out of the salaries of white-collar workers that has not flowed into goods markets, but rather into financial markets, depresses demand and discourages real investment:

> *The greater the income of the managerial, technical, and professional labor force -and the greater their savings - the lower the cash flows* [internal funds] *available for capitalist and rentier income.* (Minsky, 1986: 175)

The inflows of these augmented savings into financial markets have mainly occurred by way of private pension funds. Green (1991) emphasizes that the introduction of private pension funds had a role in raising the savings of high income-earners as "*contractual savings*" (Toporowski, 2000: 49). Excess inflow into financial markets by way of pension and health insurance funds depends on the fact that, once the contract has been concluded, a certain amount is periodically withdrawn from the bank account of the holder and, as long as the contract is not cancelled prior to retirement, the capital gains from the previous period are reinvested. This means that the fixed, quasi-compulsory rate of savings due to pension fund contracts do not fluctuate and are already integrated into financial markets. In addition, it indicates that pension savings that have flowed into financial markets feed back upon themselves, being affected, namely, by their lagged values.

As a proxy, Figure 6 supports the assumption that white-collar workers constitute the greater part of private pension plan and insurance plan holders[20]. It should be noted that even if both groups of workers had the same coverage rate, white-collar workers would have still been able to contribute a higher amount to pension funds, and hence to inflation in financial markets, due to the wage inequality between them. Skott underscores this point as follows:

> *The poor have few financial assets and their portfolio is skewed towards fixed-income assets. The rich, by contrast, hold a large proportion of their wealth in stocks. Thus, an increase in inequality tends to raise the demand for stocks.* (Skott, 2011: 2)

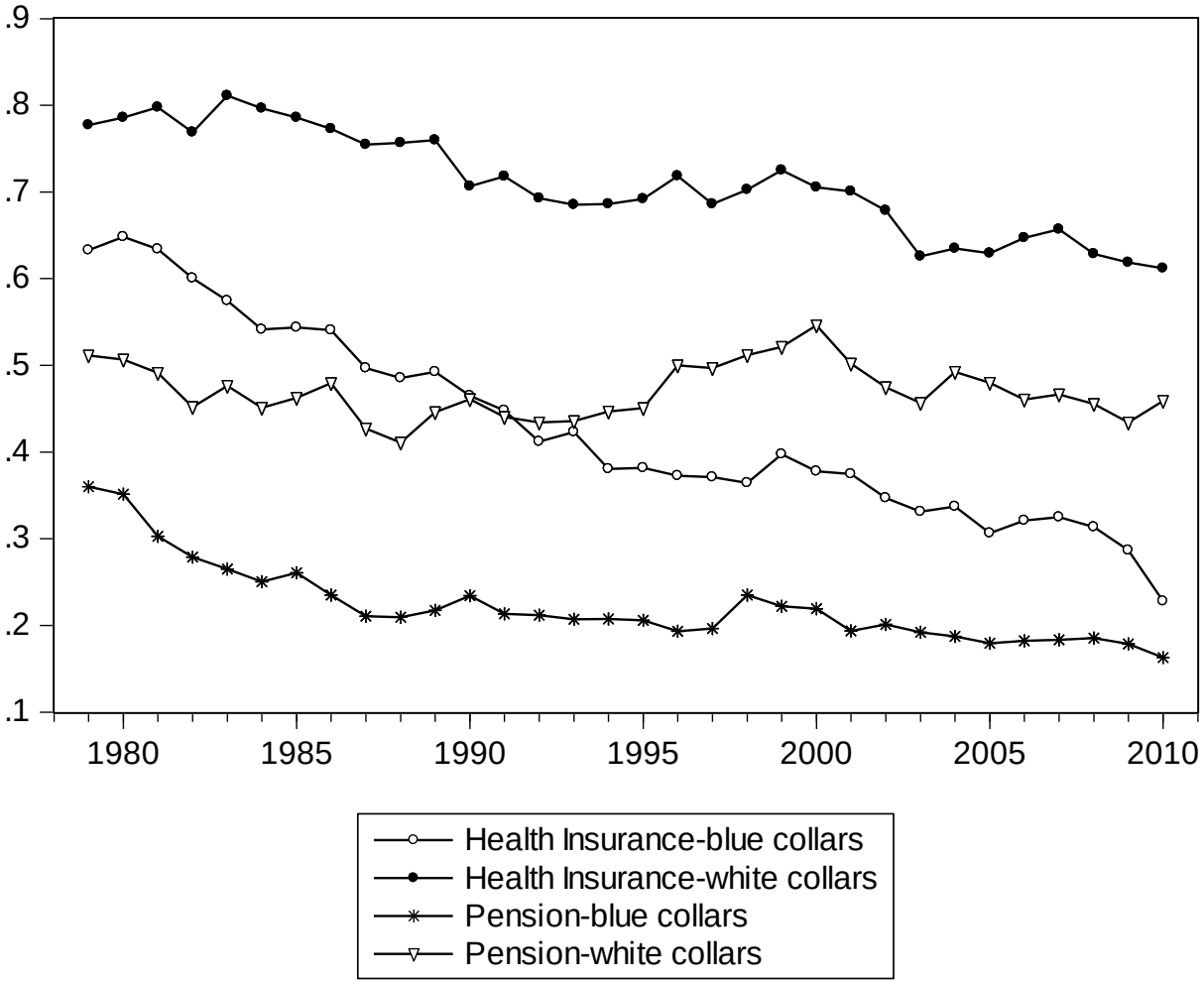

Figure 6: Share of blue-collar and white-collar workers who received health insurance from their own job for which their employer paid for at least some of their health insurance coverage and who are included in an employer-provided plan for which the employer paid for at least some of their pension coverage. Source: http://www.epi.org/data/#?subject=healthcov&e=* and http://www.epi.org/data/#?subject=pensioncov&e=*

[20] The declining trend does not matter, since the graph shows the provision rate by employers. More importantly, the main point that the figure illustrates is that more white-collar workers participate in private pension and health insurance funds than blue-collar workers. Declining provision of the employers' contribution and a rising trend in the volume of pension and health insurance funds indicates that employees are contributing by way of their own net salary.

In this section, I showed that the employment share and savings of white-collar workers have increased and that they have more pension plan and health insurance coverage than blue-collar workers. The following section deals with the empirical testing of the hypothesis.

4. Empirical Evidence

This section deals with the empirical testing of the main argument that rising wage dispersion between white-collar and blue-collar workers has led to the rise and expansion of pension funds. The testing is carried out by way of US annual data for the period between 1966 and 2013[21]. The reason for using the 49-year time span and examining macro data is to demonstrate and to capture this long-run structural tendency during the recent decades in which the dramatic changes in question have taken place.

4.1. Data Description and the Model

As the main argument of the paper is that there is a structural and direct causal relationship between pension funds and wage dispersion, a VAR model with impulse response function and variance decomposition analysis is one of the best options for examining such an argument[22]. In VAR modelling, "*each endogenous variable is assumed to depend on lagged values of itself and of all other endogenous variables*" (Dées and Güntner, 2016: 5). Such an assumption is appropriate both for pension funds and wage dispersion, since, as pointed out above, they feed back upon themselves,. The non-stationarity of variables (see Table 1 in the appendix) confirms that both variables are being affected by their lagged values.

As this paper deals merely with the causality running from wage dispersion to pension funds, the flipside of the relationship (i.e. causality running from pension funds to wage dispersion) is neglected and left for further research – this despite the fact that VAR modelling assumes that the relationship is bi-directional.

The impulse response function reveals whether the causality between variables is direct or not and variance decomposition analysis "*provides valuable supplementary information about the interlinkages among the variables in the model*" (Greenwood-Nimmo and Tarassow, 2013: 12). Both analyses provide structural clarification of how strong and how long-lasting the effects are. Moreover, the impulse response function has an advantage inasmuch as it reveals that the power of the effects is not stable, but rather might fluctuate and might even turn in the opposite direction (from positive to negative and vice-versa) after a certain time.

Tarassow (2010) describes what is being analysed by way of the impulse response function and variance decomposition as follows:

> *…impulse-response function which computes the propagation over time of a shock on the variable of interest. The variance decomposition analyzes the*

[21] The relationship between financialisation and pension funds will not be tested, since this relationship has already been noted and examined in the financialisation literature.

[22] As to why I do not opt for any endogenous or exogenous control variable in the model, it is due to the fact that what is being tested is merely whether the causality is direct or not.

> *relative impact of a shock in one variable on the total variance of the variable of interest – it measures the relative impact of a structural shock for the explanation of the total variance of the dependent variable.* (Tarassow, 2010: 14-15).

As I am directly dealing with the dispersion between wages of production workers (blue-collar workers) and salaries of overhead ancillary labour (white-collar workers), I employ the ratio of average hourly wages of non-production (overhead) workers to average hourly wages of production workers to measure the wage differential at the macro level.

The wage differential (wd) as the ratio of the salaries of ancillary white-collar non-production workers to the wages of blue-collar production workers is calculated as follows:

$$wd = \frac{c/h - p}{p}$$

Equation 1: Wage Differential

In the equation, *c* stands for compensation of all employees[23], *h for* total worked hours[24], and *p* for the annual average hourly wages paid to production workers[25]. The numerator gives the average hourly wages paid to ancillary (overhead) non-production employees: namely, white-collar workers.

The share of pension funds in household wealth is calculated as the ratio of the total value of pension funds held by US households to their total financial wealth. The data was retrieved from Table A3 of saezzucman.eu. The reason why it is preferable to employ pension funds' share in household wealth in the model, instead of total liabilities of private pension fund institutions in the market, is to show whether the pension savings channeled into markets have realized gains and validated themselves[26].

As the variables have either non-stationarity or trend and have no co-integration problem, I employ their log differences and run an unrestricted Vector Autoregressive Model with E-Views 8. AIC (Akaike Information Criterion) suggests a 4-period lag length. The LM Autocorrelation test results also indicate that the model has no autocorrelation problem. The model has also no stability problem, according to the Inverse Roots of the AR Characteristic Polynomial. (See the appendix for all test results).

$$p_t = c_1 + ß_{11}^1\, p_{t-1} + ß_{12}^1\, wd_{t-1} + \ \dots + ß_{11}^4\, p_{t-4} + ß_{12}^4\, wd_{t-4}$$

$$wd = c_1 + ß_{21}^1\, p_{t-1} + ß_{22}^1\, wd_{t-1} + \ \dots + ß_{21}^4\, p_{t-4} + ß_{22}^4\, wd_{t-4}$$

Equation 2: VAR(4) Model Equation

[23] https://fred.stlouisfed.org/series/A576RC1
[24] https://fred.stlouisfed.org/series/TOTLQ
[25] https://fred.stlouisfed.org/series/AHETPI and https://fred.stlouisfed.org/series/A132RC1
[26] Since the available dataset was not decomposed, I did not have the possibility of extracting capitalists' share from households. But I do not expect that this would lead to any empirical or theoretical shortcomings, since "*pension savings are deferred wage*" (Engelen, 2003: 1364).

In the equations, p stands for pension funds' share in household wealth and wd stands for wage dispersion between white-collar and blue-collar workers.

4.2. Results

The analysis of the impulse response function results shown in Figure 7 is as follows[27]:

The responses of pension funds' share in household wealth to wage dispersion are positive and significant over the first 3 periods and thereafter become insignificant. This result does not falsify and strongly supports the main argument of this paper that pension funds have a direct causal relationship with wage dispersion.

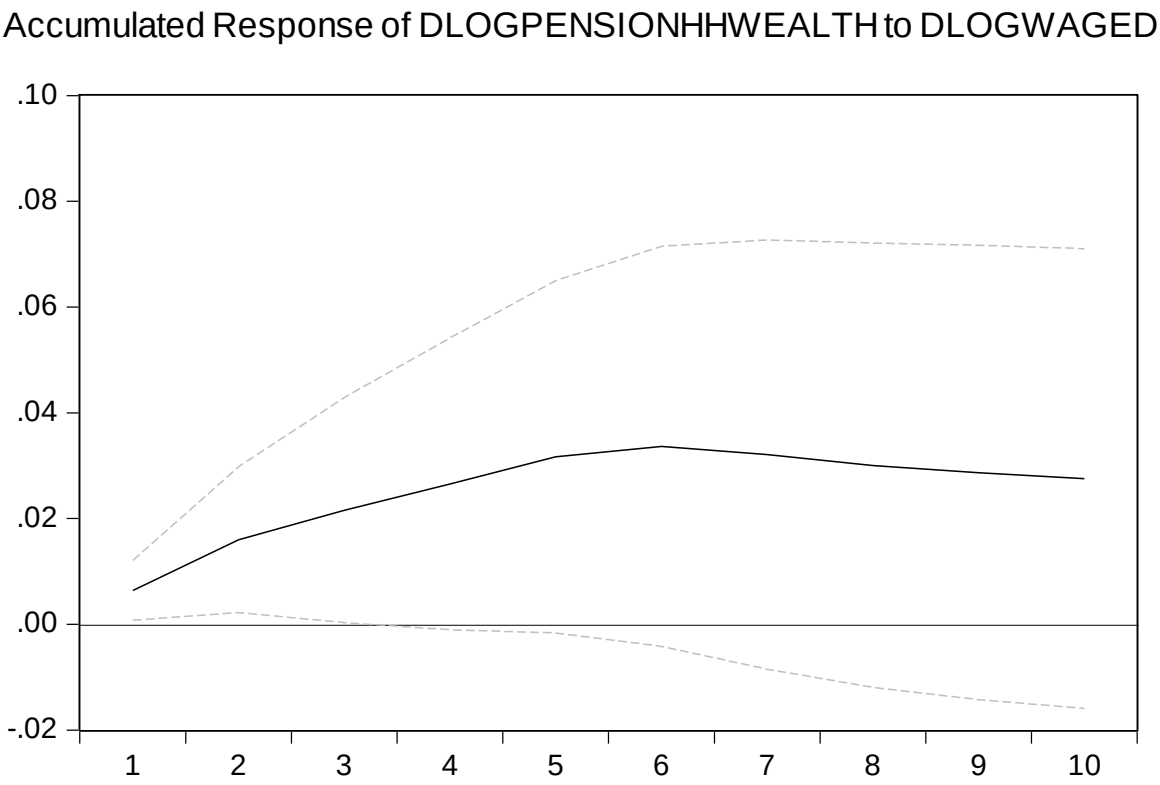

Figure 7: Impulse Response Function Results[28] for the period 1966-2013

In the short term, 11% of the variations in pension funds' share in household wealth are due to wage dispersion (see Figure 8) and this figure reaches 19% in the fifth period. The fact that around 20% of long-term variations are explained by wage dispersion confirms that the relationship is one of structural causality[29].

[27] See Table 5 in the appendices for the values.

[28] The IRF-figures represent the accumulated responses, since the growth rates (log differences) of the variable are employed in the model. Secondly, accumulated responses indicate that the shocks create a path: i.e. that the responses are not temporary. The dotted lines represent the standard errors, i.e. the 95% significance level. If both of the dotted lines are not in the same area (i.e. if one is above and the other is under the 0 (zero), then the responses are not significant. In this case, one period represents one year, since the data is annual.

[29] See Table 6 in the appendices for the values.

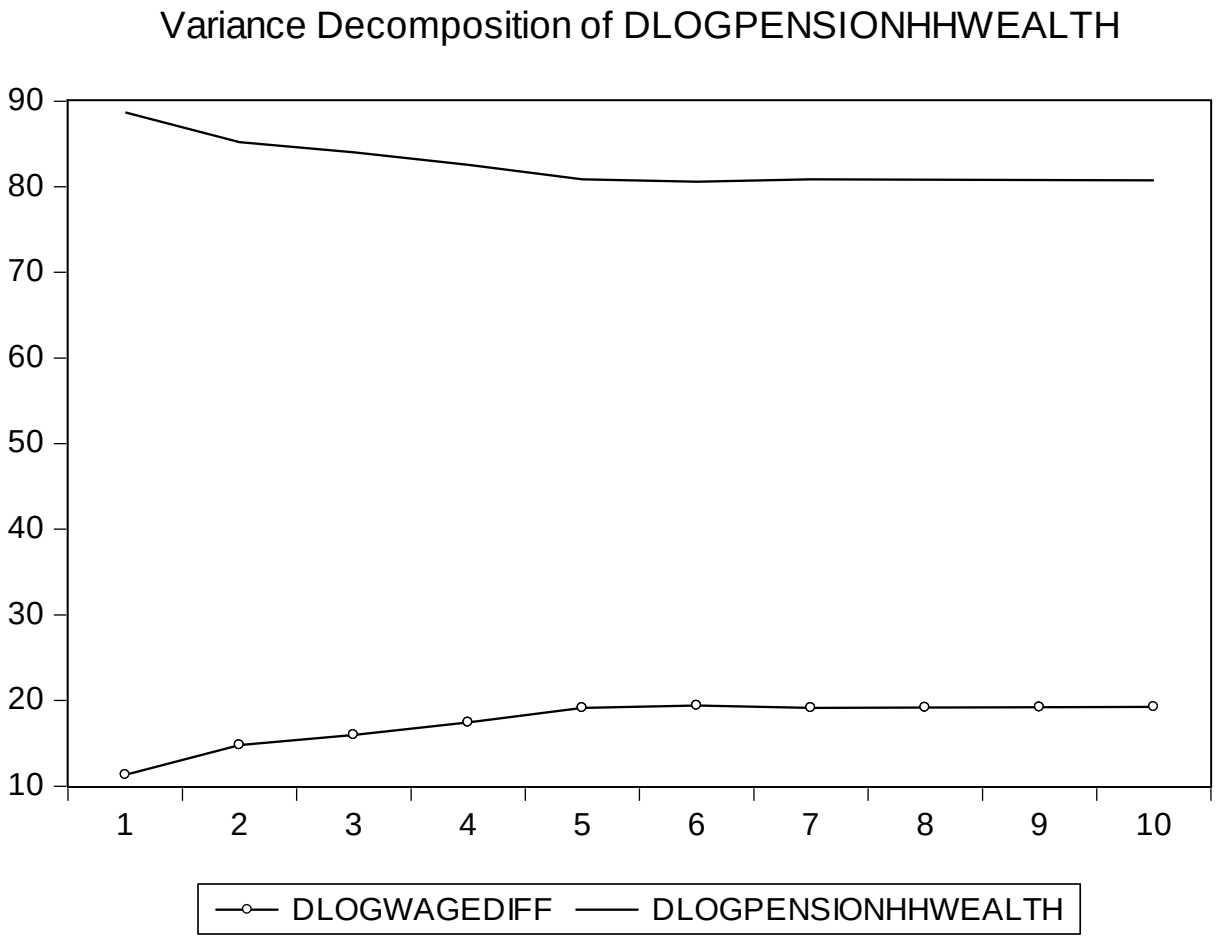

Figure 8: Variance Decomposition Analysis Results for the period 1966-2013

5. Conclusion

I have argued that the pension funds that have inflated financial markets are affected in a direct and structural manner by rising wage dispersion between white-collar and blue-collar workers, since higher income enables white-collar workers to save more.

The VAR Model analysis results show that the hypothesis has not been falsified at an at least 95% confidence level.

The findings show that the responses of the share of pension funds in US-household wealth to one-unit shock in wage dispersion are positive and significant over the first 3 years. Furthermore, 11% of variations in pension funds' share in household wealth are explained by wage dispersion in the short-run and 19% of variations are explained by wage dispersion in the long-run

We can thus conclude that the inflation of financial markets by pension funds, which has contributed to the financialisation of NFCs, depends, first and foremost, on increased wage dispersion between white-collar and blue-collar workers.

Comparison to other countries – for example, Finland or the Netherlands (McCarthy et al, 2016) – which have experienced wage dispersion, but only a limited expansion of pension funds and financialisation (or vice-versa), calls for further research.

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APPENDICES: TEST RESULTS

Null Hypothesis: PENSIONSHHWEALTH has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 5 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.457751	0.8283
Test critical values:	1% level	-4.192337	
	5% level	-3.520787	
	10% level	-3.191277	

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PENSIONSHHWEALTH(-1)	-0.062570	0.042923	-1.457751	0.1541
D(PENSIONSHHWEALTH(-...	1.326214	0.163348	8.118960	0.0000
D(PENSIONSHHWEALTH(-...	-0.977870	0.238282	-4.103833	0.0002
D(PENSIONSHHWEALTH(-...	0.936504	0.253770	3.690358	0.0008
D(PENSIONSHHWEALTH(-...	-0.868289	0.258903	-3.353730	0.0020
D(PENSIONSHHWEALTH(-...	0.386102	0.191992	2.011036	0.0523
C	0.004859	0.002476	1.962450	0.0579
@TREND("1960")	0.000352	0.000273	1.291389	0.2053

Null Hypothesis: WAGEDIFF has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.825316	0.9563
Test critical values:	1% level	-4.148465	
	5% level	-3.500495	
	10% level	-3.179617	

Variable	Coefficient	Std. Error	t-Statistic	Prob.
WAGEDIFF(-1)	-0.050425	0.061098	-0.825316	0.4133
C	0.013402	0.004702	2.849910	0.0064
@TREND("1960")	0.000400	0.000651	0.614844	0.5416

Table 1: Unit Root Test Results

Date: 03/19/17 Time: 03:35
Sample (adjusted): 1971 2013
Included observations: 43 after adjustments
Trend assumption: Linear deterministic trend (restricted)
Series: PENSIONSHHWEALTH WAGEDIFF
Lags interval (in first differences): 1 to 4

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.246233	14.37081	25.87211	0.6269
At most 1	0.050228	2.215941	12.51798	0.9539

Trace test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.246233	12.15487	19.38704	0.4009
At most 1	0.050228	2.215941	12.51798	0.9539

Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 2: Johansen System Co-integration Test Results

VAR Residual Serial Correlation LM ...
Null Hypothesis: no serial correlation...
Date: 03/19/17 Time: 03:11
Sample: 1960 2015
Included observations: 43

Lags	LM-Stat	Prob
1	3.882641	0.4221
2	5.832173	0.2120
3	6.178198	0.1862
4	9.370587	0.0525
5	4.692435	0.3203
6	4.677515	0.3220
7	1.637682	0.8020
8	2.811697	0.5898
9	5.425681	0.2463
10	4.306260	0.3661
11	0.201905	0.9952
12	1.966213	0.7420

Probs from chi-square with 4 df.

Table 3: Serial Correlation Test Results

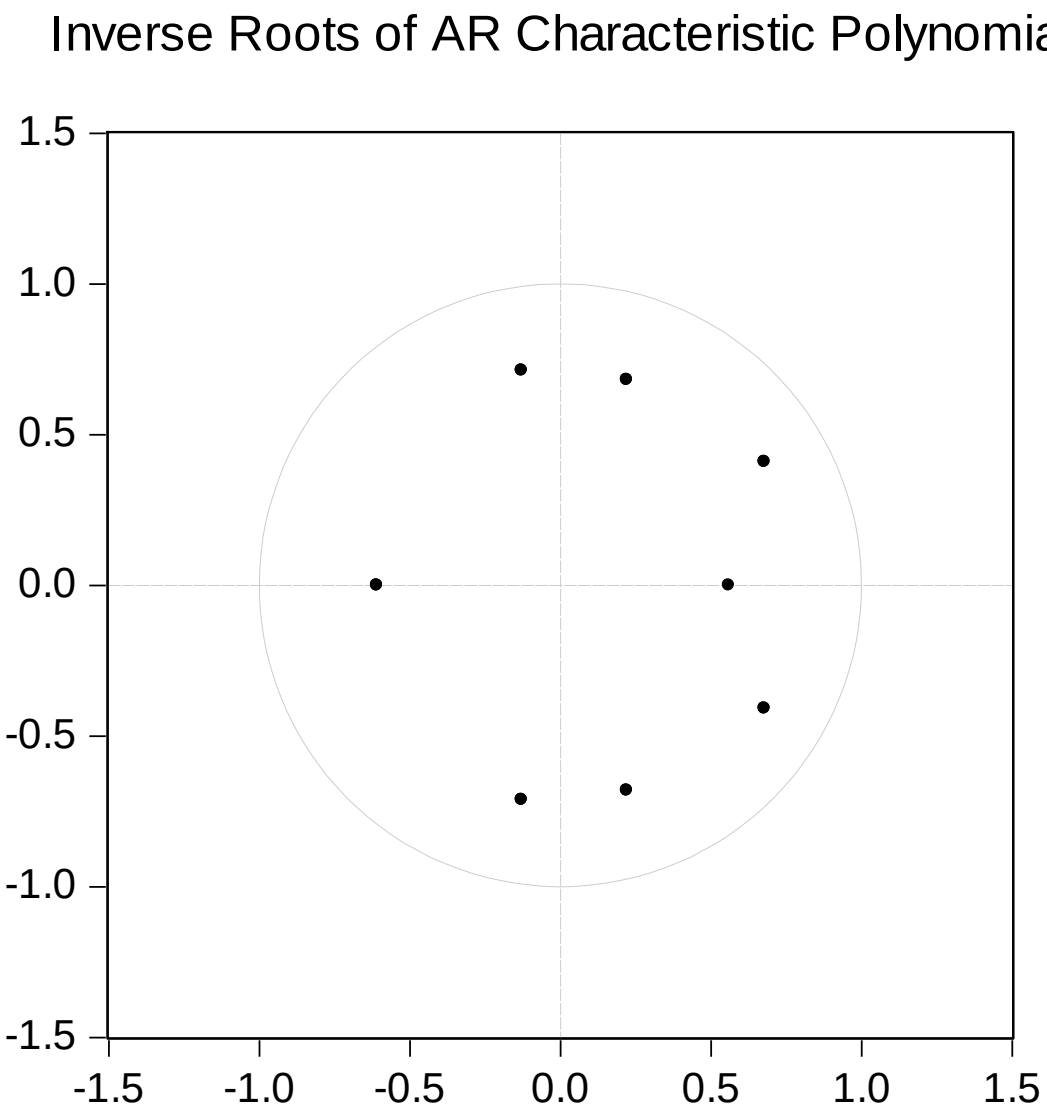

Figure 9: Inverse Roots of AR Characteristic Polynomial

VAR Lag Order Selection Criteria
Endogenous variables: DLOGWAGEDIFF DLOGPENSIONHHWEALTH
Exogenous variables: C
Date: 03/19/17 Time: 03:06
Sample: 1960 2015
Included observations: 42

Lag	LogL	LR	FPE	AIC	SC	HQ
0	153.5219	NA	2.52e-06	-7.215330	-7.132584	-7.185001
1	172.3755	35.01376	1.24e-06	-7.922643	-7.674405	-7.831654
2	180.0835	13.58078*	1.04e-06	-8.099215	-7.685484*	-7.947566*
3	183.9761	6.487695	1.05e-06	-8.094102	-7.514878	-7.881793
4	189.4241	8.561028	9.90e-07*	-8.163050*	-7.418335	-7.890083
5	191.7345	3.410626	1.09e-06	-8.082594	-7.172387	-7.748967

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Table 4: Lag Order Selection Criteria

Accumulated Response of DLOGP...		
Period	DLOGWAG...	DLOGPENSI...
1	0.006413	0.017961
	(0.00282)	(0.00194)
2	0.015973	0.038929
	(0.00690)	(0.00514)
3	0.021571	0.048922
	(0.01065)	(0.00909)
4	0.026510	0.054239
	(0.01380)	(0.01275)
5	0.031652	0.058308
	(0.01665)	(0.01642)
6	0.033641	0.057120
	(0.01892)	(0.01982)
7	0.032073	0.052091
	(0.02031)	(0.02233)
8	0.030036	0.048091
	(0.02102)	(0.02368)
9	0.028684	0.045901
	(0.02148)	(0.02419)
10	0.027546	0.044392
	(0.02174)	(0.02399)
Cholesky Ordering: DLOGWAGEDI...		
Standard Errors: Analytic		

Table 5: Impulse Response Function

Variance Decomposition of DLOGPENSIONHHWE...			
Period	S.E.	DLOGWAG...	DLOGPENSI...
1	0.019071	11.30637	88.69363
2	0.029913	14.81111	85.18889
3	0.032031	15.97157	84.02843
4	0.032843	17.45294	82.54706
5	0.033491	19.14134	80.85866
6	0.033571	19.40106	80.59894
7	0.033982	19.14757	80.85243
8	0.034277	19.17265	80.82735
9	0.034373	19.21969	80.78031
10	0.034425	19.27109	80.72891
Cholesky Ordering: DLOGWAGEDIFF DLOGPENSI...			

Table 6: Variance Decomposition

Multiple breakpoint tests
Bai tests of breaks in all recursively determined partitions
Date: 06/06/17 Time: 09:02
Sample: 1960 2015
Included observations: 51
Breakpoint variables: C WAGEDIFF(-1)
Break test options: Trimming 0.15, Max. breaks 5, Sig. level 0.05

Sequential F-statistic determined breaks:			0
Break Test	Break	F-statistic	Scaled F-statistic
0 vs. 1	1980	5.721315	11.44263

* Significant at the 0.05 level, Bai-Perron (Econometric Journal, 2003) critical value 11.47.

Table 7: Structural-Break Test: Wage Dispersion